WHAT IS CLAIMED:

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1. A method of inducing neuronal production in post-natal and adult brain and spinal cord comprising:

providing a nucleic acid construct encoding a neurotrophic factor and

injecting the nucleic acid construct into a subject's lateral ventricles or ventricular zone wall under conditions effective to express the neurotrophic factor and to induce neuronal production in the brain and spinal cord of the subject.

2. A method according to claim 1, wherein the nucleic acid construct is in a viral vector.

3. A method according to claim 2, wherein the viral vector is an adenoviral vector, a lentiviral vector, a retroviral vector, an adeno-associated viral vector, or a combination thereof.

4. A method according to claim 1, wherein the nucleic acid construct further comprises a constitutive promoter for controlling expression of the neurotrophic factor.

5. A method according to claim 1, wherein the nucleic acid construct further comprises a cell-specific promoter for controlling expression of the neurotrophic factor.

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6. A method according to claim 1, wherein the nucleic acid construct further comprises an inducible or conditional promotor for controlling expression of the neurotrophic factor.

7. A method according to claim 1, wherein the neurotrophic factor is brain-derived neurotrophic factor.

8. A method according to claim 1, wherein the neurotrophic factor is neurotrophin-4/5.

9. A method according to claim 1, wherein the neurotrophic factor is neurotrophin-3.

10. A method according to claim 1, wherein the neurotrophic factor is insulin-like growth factor-1.

11. A method according to claim 1, wherein the neurotrophic factor is noggin.

12. A method according to claim 1, wherein the neurotrophic factor is an inhibitor of bone morphogenic proteins.

13. A method of recruiting neurons to a subject's brain comprising:
providing a nucleic acid construct encoding a neurotrophic factor and

injecting the nucleic acid construct into the subject's lateral ventricles or ventricular zone wall under conditions effective to express the neurotrophic factor and to recruit neurons to the brain of the subject.

14. A method according to claim 13, wherein the nucleic acid construct is in a viral vector.

15. A method according to claim 14, wherein the viral vector is an adenoviral vector, a lentiviral vector, a retroviral vector, an adeno-associated viral vector, or a combination thereof.

16. A method according to claim 13, wherein the nucleic acid construct further comprises a constitutive promoter for controlling expression of the neurotrophic factor.

17. A method according to claim 13, wherein the nucleic acid construct further comprises a cell-specific promoter for controlling expression of the neurotrophic factor.

18. A method according to claim 13, wherein the nucleic acid construct further comprises an inducible or conditional promotor for controlling expression of the neutrophic factor.

19. A method according to claim 13, wherein the neurotrophic factor is brain-derived neurotrophic factor.

20. A method according to claim 13, wherein the neurotrophic factor is neurotrophin-4/5.

21. A method according to claim 13, wherein the neurotrophic factor is neurotrophin-3.

22. A method according to claim 13, wherein the neurotrophic factor is insulin-like growth factor-1.

23. A method according to claim 13, wherein the neurotrophic factor is noggin.

24. A method according to claim 13, wherein the neurotrophic factor is an inhibitor of bone morphogenic proteins.

25. A method according to claim 13, wherein recruitment of neurons is to the olfactory bulb.

26. A method according to claim 13, wherein recruitment is to the basal ganglia of the brain, the caudate nucleus, the putamen, and/or the globus pallidus.

27. A method according to claim 13, wherein recruitment of neurons is to the cortex.

28. A method of treating a neurodegenerative condition comprising:

providing a nucleic acid construct encoding a neurotrophic factor and

injecting the nucleic acid construct into a subject's lateral ventricles or ventricular zone wall under conditions effective to treat a neurodegenerative condition.

29. A method according to claim 28, wherein the neurodegenerative condition is selected from the group consisting of Huntington's Disease, Parkinson's Disease, amyotrophic lateral sclerosis, multiple sclerosis, stroke, and traumatic injury to the brain and spinal cord.

30. A method according to claim 29, wherein the neurodegenerative condition is Huntington's Disease.

31. A method according to claim 29, wherein the neurodegenerative condition is traumatic brain injury.

32. A method according to claim 29, wherein the neurodegenerative condition is stroke.

33. A method according to claim 28, wherein the nucleic acid construct is in a viral vector.

34. A method according to claim 33, wherein the viral vector is an adenoviral vector, a lentiviral vector, a retroviral vector, an adeno-associated viral vector, or a combination thereof.

35. A method according to claim 28, wherein the nucleic acid construct further comprises a constitutive promoter for controlling expression of the neurotrophic factor.

36. A method according to claim 28, wherein the nucleic acid construct further comprises a cell specific promoter for controlling expression of the neurotrophic factor.

37. A method according to claim 28, wherein the nucleic acid construct further comprises an inducible or conditional promotor for controlling expression of the neutrophic factor.

38. A method according to claim 28, wherein the neurotrophic factor is brain-derived neurotrophic factor.

39. A method according to claim 28, wherein the neurotrophic factor is neurotrophin-4/5.

40. A method according to claim 28, wherein the neurotrophic factor is neurotrophin-3.

41. A method according to claim 28, wherein the neurotrophic factor is insulin-like growth factor-1.

42. A method according to claim 28, wherein the neurotrophic factor is noggin.

43. A method according to claim 28, wherein the neurotrophic factor is an inhibitor of bone morphogenic proteins.

44. A method of treating a neurodegenerative condition comprising: providing a neurotrophic factor and

injecting the neurotrophic factor into a subject's lateral ventricles or ventricular zone wall under conditions effective to treat a neurodegenerative condition.

45. A method according to claim 44, wherein the neurodegenerative condition is selected from the group consisting of Huntington's Disease, Parkinson's Disease, amyotrophic lateral sclerosis, multiple sclerosis, stroke, and traumatic injury to the brain and spinal cord.

46. A method according to claim 45, wherein the neurodegenerative condition is Huntington's Disease.

47. A method according to claim 44, wherein the neurotrophic factor is brain-derived neurotrophic factor.